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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,221	09/28/2001	Masakatsu Gotou	501.40695X00	3864

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EXAMINER

LATTIN, CHRISTOPHER W

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 01/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/965,221

Applicant(s)

GOTOU ET AL.

Examiner

Christopher W Lattin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

Figures 23A-26B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how one side of a flat substrate can face another side. See e.g. claim 1 lines 9 and 10.

The term "many" in claims 10, 11, 22 and 23 is a relative term which renders the claim indefinite. The term "many" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuruta (U.S. Patent 6,200,121) in view of Wensel (U.S. Patent 5,963,792).

Tsuruta teach all of the limitations of the presently claimed manufacturing method including forming a resin enclosure for block-molding a plurality of semiconductor chips by placing a plurality of semiconductor chips inside a cavity of a molding die along with a glass fiber reinforced substrate (a.k.a. FR4) and then injecting a resin inside said cavity from a first side to a second side of a main surface of the substrate, the plurality of semiconductor chips being mounted on the main surface of the substrate from the first side to the second side of the surface with a predetermined space, but fail to teach cleaning the surface of the substrate prior to placing it in the enclosure. Wensel teach that cleaning is required for FR-4 substrates prior to encapsulation to remove unwanted organic compounds and thus obtain sufficiently strong adhesion between the encapsulant material and the FR-4. It would have been obvious to one skilled in the art at the time of the invention to clean the substrate taught by Tsuruta prior to encapsulation to remove unwanted organic compounds and thus obtain sufficiently strong adhesion between the encapsulant material and the FR-4 as taught by Wensel. See Wensel column 2 lines 39-44. Tsuruta also fails to specify how or if the chips are

connected to substrates. Wensel teaches wire bonding to electrically connect the chips to the substrate. It would have been obvious to one skilled in the art at the time of the invention to utilize wire bonds to connect the chips to the substrate.

Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuruta (U.S. Patent 6,200,121) in view of Wensel (U.S. Patent 5,963,792) and Hsu et al. (U.S. Patent 6,338,813).

Tsuruta teach all of the limitations of the presently claimed manufacturing method including forming a resin enclosure for block-molding a plurality of semiconductor chips by placing a plurality of semiconductor chips inside a cavity of a molding die along with a glass fiber reinforced substrate (a.k.a. FR4) and then injecting a resin inside said cavity from a first side to a second side of a main surface of the substrate, the plurality of semiconductor chips being mounted on the main surface of the substrate from the first side to the second side of the surface with a predetermined space, but fail to teach cleaning the surface of the substrate prior to placing it in the enclosure. Wensel teach that cleaning is required for FR-4 substrates prior to encapsulation to remove unwanted organic compounds and thus obtain sufficiently strong adhesion between the encapsulant material and the FR-4. It would have been obvious to one skilled in the art at the time of the invention to clean the substrate taught by Tsuruta prior to encapsulation to remove unwanted organic compounds and thus obtain sufficiently strong adhesion between the encapsulant material and the FR-4 as taught by Wensel. See Wensel column 2 lines 39-44. Tsuruta also fails to specify that multiple chips could

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be stacked prior to encapsulation. Hsu et al. teach a method of stacking chips prior to encapsulation, which conserves space, reduces circuit lengths and thus increases device speed. It would have been obvious to one skilled in the art at the time of the invention to stack devices prior to the encapsulation taught by Tsuruta in order to increase device speed as taught by Hsu et al. See also Hsu et al. (U.S. Patent 6,462,421) for explanation of the benefits of forming chip stacks.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Lattin whose telephone number is (703) 305-3017. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached at (703) 308-3325. The fax numbers for this Group are (703) 872-9318 for responses to non-final actions and (703) 872-9319 responses to final actions.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800

CWL 
January 6, 2003